

FACT SHEET FOR NPDES PERMIT WA0040711

FACILITY NAME EXTERIOR WOOD, INC.

SUMMARY

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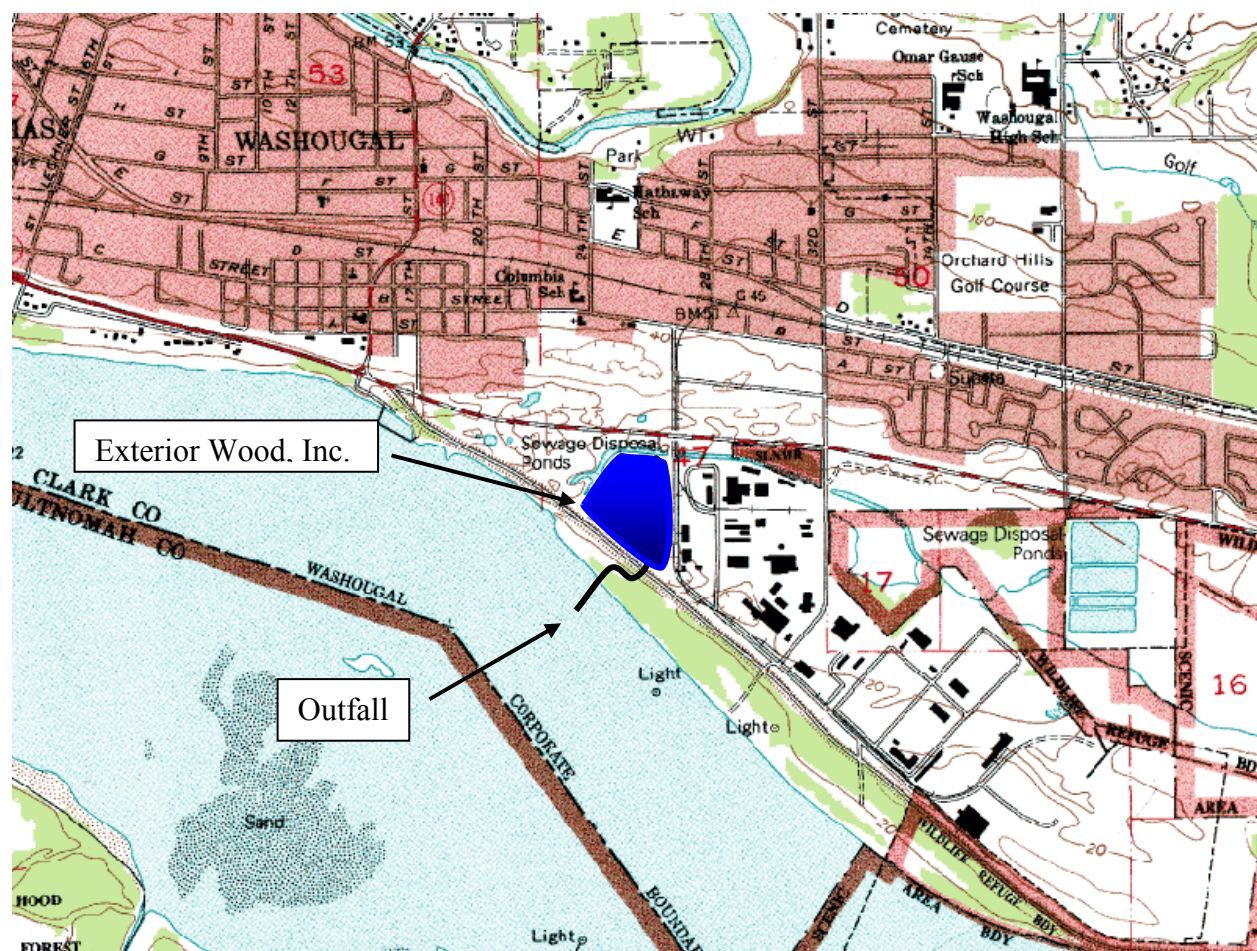
INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Mr. Robert Babb, HR/EHS Manager
Facility Name and Address:	Exterior Wood, Inc. 2685 Index Street Washougal, WA 98671
Type of Facility:	Wood Preserving
SIC Code	2491
Discharge Location:	Waterbody name: Columbia River Latitude: 45° 34' 15" N Outfall 001 Longitude: 122° 20' 40" W
Receiving Water:	Columbia River at Mile 123.2
Water Body ID Number:	WA-CR-1010



BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Exterior Wood Inc. (Exterior) began its wood treating operation in 1977. The entire facility (approximately 12.7 acres) is paved, including the processing area, tank farm, and untreated and treated product storage area. The processing area, some of the tanks, and part of the treated and untreated wood storage area are covered. Exterior produces two types of treated wood:

1. Wood for building projects that require rot and insect resistant wood. This wood is treated with two types of chemicals:
 - a. Chromated copper arsenate (CCA), or
 - b. Copper aezole (CA)

The majority of wood is treated with CA.

2. Wood treated with DRICON fire retardant.

The site is located south of Lewis and Clark Highway, between 27th and Index Street in the Camas/Washougal Industrial Park in Washougal. The Industrial Park is adjacent to Steigerwald Lake National Wildlife Refuge.

INDUSTRIAL PROCESS

Lumber is pressure treated with a water-based CCA or CA formulations that are described below. Both treated and untreated (white wood) wood is stored on the site. When the treated lumber is removed from the CCA or CA pressure treating retorts, it is first stored in a covered area to allow fixation of the wood treatment chemicals. The treated lumber is then wrapped or “shed-wrapped” with plastic, then moved to the uncovered storage yard. The storage yard is located across the street and highway and is not a contiguous part of the main permitted facility. Therefore, it is not permitted under this permit.

The lumber that is processed with fire retardant is kiln dried, wrapped with paper, and stored in covered areas to prevent contact with storm water.

Three water-based treating solutions are used.

1. Chromated copper arsenate (CCA) solution consists of chromated (as chromic oxide, CrO_3) copper (as cupric oxide, CuO) arsenate (as arsenic pentaoxide, As_2O_5). A 50 percent solution of CCA is delivered to the site. The solution used to treat wood is 1.2 percent, 2 percent, or 2.9 percent CCA.
2. Wolman E Wood Preservation Concentrate (copper aezole) (CA) contains the following active ingredients:
 - a. Basic copper carbonate

- b. Boric acid
 - c. Tebuconazole
 - d. Ethanolamines (combination)
 - e. Inert ingredients and water
3. DRICON fire retardant contains boric acid as an active ingredient. DRICON is used either as a 7 percent or 13 percent solution.

DISCHARGE OUTFALL

Exterior discharges stormwater during storm events to the Columbia River. The outfall was designed to accommodate the combined storm water discharge from Exterior and Allweather Wood Treaters (Allweather). The two companies submitted a joint engineering report for the combined outfall, and Exterior built it. The new outfall is being used by Exterior only. Allweather has not built its connection to the combined outfall, opting instead to install a developmental stormwater treatment system. (Please see the fact sheet for Allweather Wood Treaters, NPDES Permit No. WA0040029, for more information on that facility.)

The outfall diffuser consists of twelve 4-inch diameter Red Valve™ Tideflex Diffusers at 12 foot intervals and located at a depth of 17 feet bellow the surface during a 7Q10¹ flow event (Maul Foster & Alongi, Inc., 1997).

PERMIT STATUS

The previous permit for this facility was issued on January 30, 2001 and modified on August 8, 2001. The previous permit placed effluent limitations as listed in Table 1.

Table 1 Effluent limitations in the previous permit

	EFFLUENT LIMITATIONS: OUTFALL 001	
Parameter	Average Monthly^a	Maximum Daily^b
pH (standard units)	between 6 and 9	
O & G ² (mg/L ³)	N/A	10
TSS ⁴ (mg/L)	N/A	270
Arsenic (µg/L ⁵)	N/A	140
Chromium (µg/L)	N/A	210
Copper (µg/L)	N/A	160
^a The average monthly effluent limitation is defined as the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured		

¹ 7 day, 10-year low flow recurrence interval

² Oil and grease

³ Milligrams per liter

⁴ Total suspended solids

⁵ Micrograms per liter

	EFFLUENT LIMITATIONS: OUTFALL 001	
Parameter	Average Monthly^a	Maximum Daily^b
during a calendar month divided by the number of daily discharges measured during that month.		
^b The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day.		

An application for permit renewal was submitted to the Department on September 27, 2002 and accepted by the Department on October 2, 2002.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on October 25, 2002.

During the history of the previous permit, the Permittee has not remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. Table 2 presents a summary of compliance over the life of the permit

Table 2 A summary of compliance over the life of the permit

DMR Beginning Date	Parameter	Units	Value	Minimum Limit	Maximum Limit	% exceeded
1-Sep-01	Copper	µg/L	206		160	29%
1-Sep-02	Copper	µg/L	342		160	114%
1-Oct-02	Copper	µg/L	167		160	4%
1-Nov-02	Copper	µg/L	305		160	91%
1-Dec-02	Copper	µg/L	258		160	61%
1-Mar-03	Copper	µg/L	178		160	11%
1-Mar-03	Oil and Grease	mg/L	13.4		10	34%
1-Apr-01	pH	S.U.	5.5	6		
1-Oct-01	pH	S.U.	5.88	6		
1-Oct-01	Tebuconazole	µg/L	Not reported			

WASTEWATER CHARACTERIZATION

The proposed wastewater discharge is characterized for the following regulated parameters:

Table 3: Wastewater Characterization

DMR Beginning Date	Arsenic	Chromium	Copper	Estimated Runoff	O&G	pH	TSS	Tebuconazole
	µg/L	µg/L	µg/L	mgd ⁶	mg/L	S.U. ⁷	mg/L	µg/L
1-Feb-01	144	221		0.799	8.6	6.4	127	
1-Mar-01	56.9	50.6	40.6	0.194	<5	6.02	27	
1-Apr-01	97	122	85.2	0.216	5.75	5.5	103	
1-May-01	74.4	120	48.7	0.130	<5	6.28	34	
1-Sep-01	63.5	87.4	206	0.048	<5	7.05	66	1.1
1-Oct-01	50.1	61.5	113	0.380	<5	5.88	20	
1-Nov-01	40.4	48.4	121	0.121	<5	6.43	49	3
1-Dec-01	27.73	25.1	80	0.043	<5	6.65	18	3.2
1-Jan-02	40.97	39.6	115	3.301	<5	6.42	35	4.1
1-Feb-02	44.5	57.5	135	1.728	7.52	6.64	83	5.1
1-Apr-02	50.7	71.1	117	1.119	<5	6.5	38	3.8
1-May-02	35.9	24.4	132	0.065	<5	6.44	25	3.8
1-Sep-02	61	57.3	342	0.011	<5	6.49	64	13
1-Oct-02	43.5	39.7	167	0.052	<5	6.45	24	6.2
1-Nov-02	53.6	22.7	305	0.052	<5	6.22	<10	9.6
1-Dec-02	54.5	64.7	258	0.190	<5	6.68	74	9.8
1-Jan-03	41	60.6	153	0.078	<5	6.7	18	7.9
1-Feb-03	39.7	37.1	151	0.372	<5	6.54	47	3.1
1-Mar-03	50.9	66.2	178	0.432	13.4	6.75	128	8.5
1-Apr-03	21.6	18.3	69.3	0.073	<5	6.87	12	5
1-May-03	19	16	65.3	0.052	<5	6.78	<10	3.7

⁶ Million-gallons per day

⁷ Standard units

Figure 2 and Figure 3 indicate that concentration of arsenic and chromium in effluent has been decreasing since the last permit was issued. The observation is consistent with Exterior replacing CCA wood preserving with CA.

Figure 4 and Figure 9 show increase of copper and tebuconazole in effluent. That is consistent with both chemicals being present in CA that is replacing CCA.

Figure 8 indicates decrease of TSS in effluent. That would be consistent with better employment of best management practices (BMPs) at the facility.

Figure 2 As – Wastewater Characterization

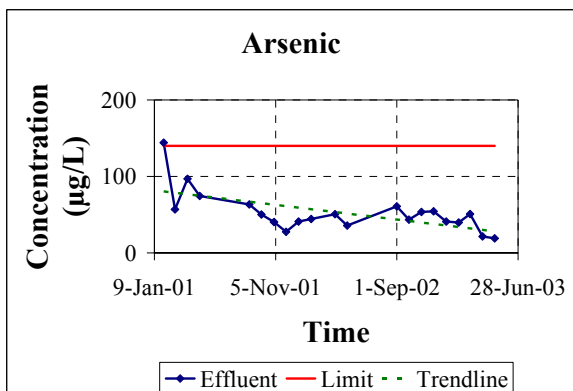


Figure 3 Cr – Wastewater Characterization

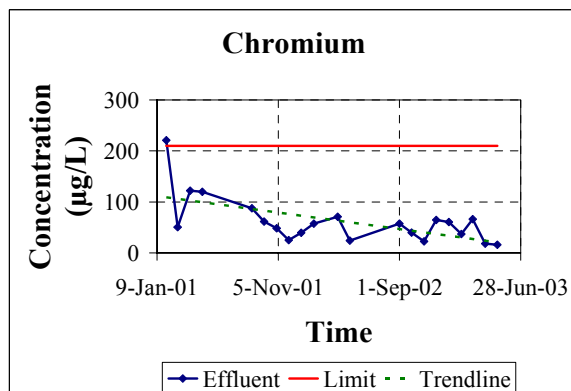


Figure 4 Cu – Wastewater Characterization

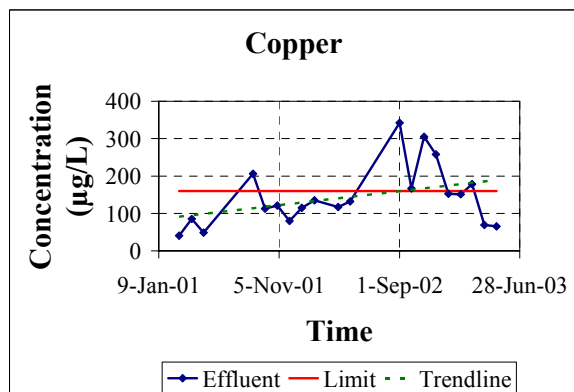


Figure 5 Runoff – Wastewater Characterization

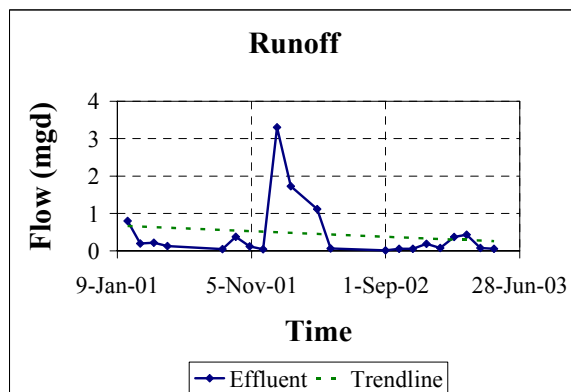


Figure 6 O&G – Wastewater Characterization

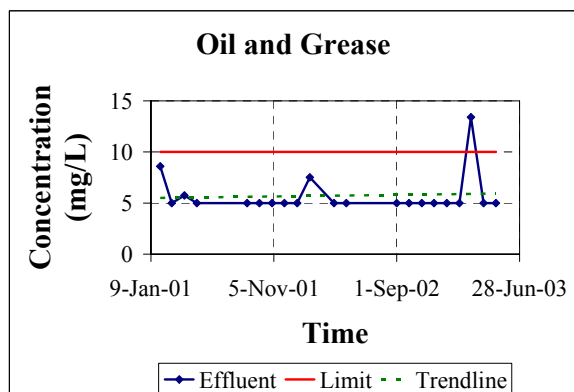


Figure 7 pH – Wastewater Characterization

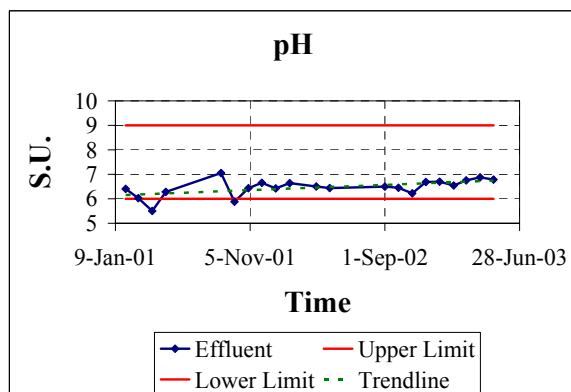


Figure 8 O&G – Wastewater Characterization

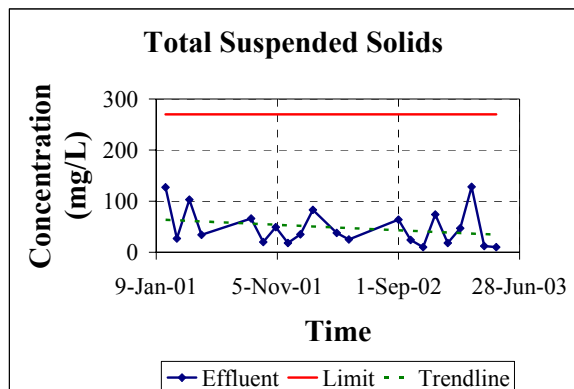


Figure 9 Tebuconazole – Wastewater Characterization

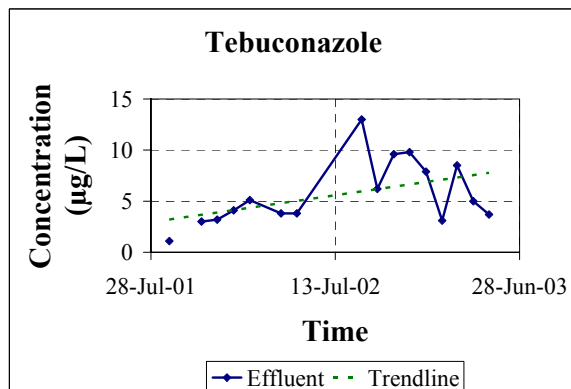


Figure 10 shows a strong correlation between chromium and arsenic in effluent. The observation is consistent with the same origin of both chemicals (CCA).

Figure 11 indicates no correlation between copper and arsenic and therefore chromium as well in effluent. That is consistent with copper being present in CA as well as CCA and chromium and arsenic being present only in CCA.

Figure 12 shows a correlation between copper and tebuconazole in effluent. The relation can not be easily explained since copper comes from CCA and CA and tebuconazole comes only from CA.

Figure 13 shows that there is no correlation between copper and TSS.

Figure 10 Chromium versus Arsenic

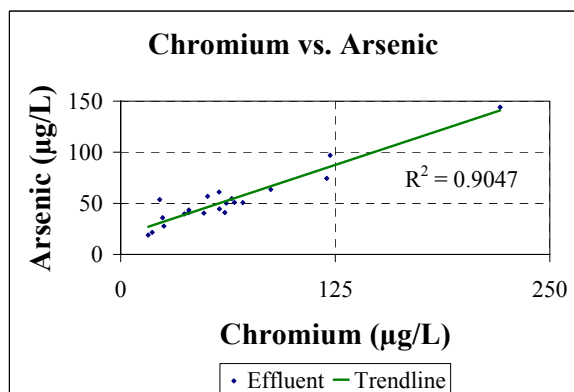


Figure 11 Copper versus Arsenic

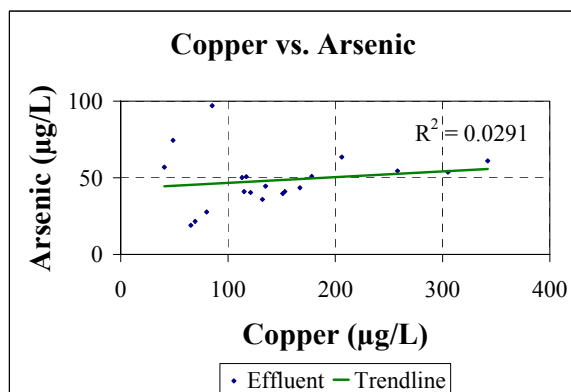


Figure 12 Copper versus Tebuconazole

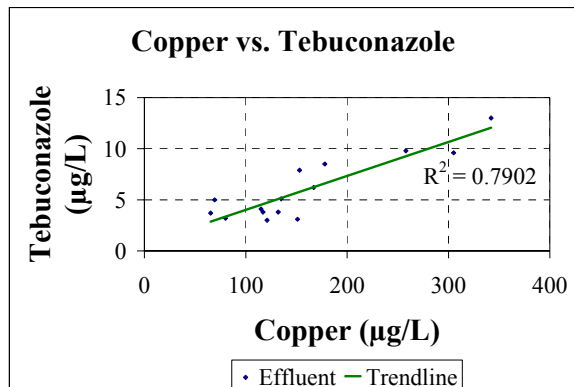
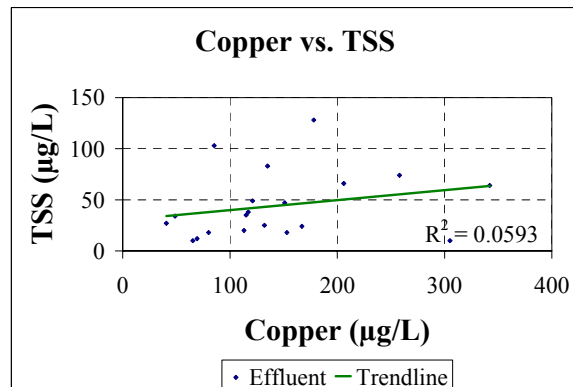


Figure 13 Copper versus TSS



SEPA COMPLIANCE

Under RCW 43.21C.0383, “the issuance, reissuance, or modification of a waste discharge permit that contains conditions no less stringent than federal effluent limitations and state rules is not subject to the requirements of RCW 43.21C.030(2)(c). This exemption applies to existing discharges only and does not apply to new source discharges.” Because this is an existing discharge covered under permit, and because the permit contains conditions no less stringent than federal effluent limitations and state rules, the issuance of the permit is exempt from RCW 43.21C.030 (2)(c). Ecology meets that statute’s objectives of environmental analysis and public involvement through preparation of this fact sheet and solicitation of public comment. (Appendix A).

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application and DMRs. The effluent constituents in the DMRs were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent

limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

Table 4 lists design parameters to collect and discharge stormwater from Exterior's site.

Table 4: Design parameters for stormwater collection and disposal system.

Parameter	Design Quantity
Impervious area	12.7 acres
Maximum pumping rate	4,600 gpm ⁸
Wet well	5,000 gallons
Horizontal storage	21,000 gallons
Outfall Tideflex diffuser	12 ports
Port spacing	12 ft
Port elevation	1.5 ft
Port depth at 7Q10 flow	17 ft
Port vertical angle	45°
Port horizontal angle	90°

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Washington State law requires that pollutants receive all known, available, and reasonable methods of prevention, control and treatment (AKART) prior to being discharged to the environment. The Department interprets AKART to be synonymous with technology-based standards.

The United States Environmental Protection Agency (USEPA) promulgated categorical guidelines for process wastewater from the wood treating industry under 40 CFR part 429. The categorical guidelines prohibit the discharge of any process wastewater, and explicitly exempted storm water from the definition of process wastewater. Exterior does not discharge any process wastewater, thus meeting the technology-based limitations for pollutants from process wastewater.

There are no federally promulgated guidelines for pollutants in stormwater from wood preserving facilities. However, the Department must make a determination that AKART has

⁸ Gallons per minute

been met for the pollutants in the storm water from Exterior's wood preserving facility. To make this determination, the Department evaluated the information provided in an engineering report submitted by Exterior and Allweather titled Stormwater Facilities Evaluation and Mixing Zone Study (Maul Foster & Alongi, Inc., 1997). Exterior evaluated the feasibility of using physical-chemical treatment to remove metals from the storm water and continue to discharge to the Gibbons Creek remnant channel. The capital and maintenance costs for a standard physical-chemical treatment system were not reasonable compared to constructing an outfall to the Columbia River. The outfall to the Columbia River was constructed without installing any treatment.

Exterior has diligently implemented a number of best management practices (BMPs) which have reduced the exposure of treated lumber to precipitation, reduced the potential for tracking of treatment chemicals off the "drip pad", and reduced the amount of suspended solids in the storm water runoff. The BMPs have successfully lowered the concentration of chromium, arsenic, and TSS since March 2001. Lower concentration of chromium and arsenic may be due to change of chemicals being used in the preservation process as well. Higher concentration of copper in stormwater is due to replacement of CCA with CA. Previously the Department has made a determination that full implementation of the BMPs satisfies the AKART requirement, however the data collected between March 2001 and May 2003 shows that additional treatment for copper and TSS might be necessary to satisfy proposed limits.

When specific technology-based effluent limitations have not been promulgated, as is the case for pollutants in storm water from wood preserving sites, the Department must develop effluent limitations on a case-by-case basis based on Best Professional Judgment (BPJ). The Department is directed to develop BPJ limitations under Section 402(a)(1)(B) of the Act. To this end, the Department is proposing the following storm water effluent limitations based on BPJ (see Table 5). BPJ limitations are set to insure that AKART continues to be met.

The Department had already placed technology-based limitations for oil and grease in the last permit. A discharge limitation of 10 mg/L was set for oil and grease.

The Department considered the stormwater monitoring data between February 2001 to May 2003 in its determination of BPJ effluent limitations for metals and TSS. The 27 months of data represent a period of time that all of the BMPs have been in place. The Department believes that storm water limitations based on the 99th percentile of the data set for each pollutant is a reasonable standard by which to ensure the continued use of the BMPs by Exterior. Any individual data points that were more than three (3x) standard deviations away from the mean were not used to calculate the 99th-percentile.

Table 5 Existing and proposed maximum daily technology based limits

Parameter	Units	Existing limit	February 1,2001 to May 31, 2003 performance	Proposed final limit	Basis for the final limit	Proposed interim limit	Basis for the interim limit
pH	S.U.	between 6 and		between 6 and 9	All industry	None	

Parameter	Units	Existing limit	February 1, 2001 to May 31, 2003 performance	Proposed final limit	Basis for the final limit	Proposed interim limit	Basis for the interim limit
		9					
O&G	mg/L	10		10	Previous permit	None	
TSS	mg/L	270	229	50	Industry AKART ⁹	229 (valid until 12/31/2005)	PP
Arsenic	µg/L	140	111	111	PP ¹⁰	None	
Chromium	µg/L	210	180	180	PP	None	

⁹ Industry AKART has already been implemented in the following NPDES permits: Cascade Pole, Manke, and Western.

¹⁰ Past performance

Parameter	Units	Existing limit	February 1, 2001 to May 31, 2003 performance	Proposed final limit	Basis for the final limit	Proposed interim limit	Basis for the interim limit
Copper	µg/L	160	467	160	Previous permit; no backsliding	300 (valid until 12/31/2006)	(¹¹)
Tebuconazole	µg/L		20	20	PP	None	

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be

¹¹ The following is Exterior's request for the 300 µg/L interim permit limit for copper. The request was approved by Ecology.

INTERIM COPPER EFFLUENT LIMITATION

The wood treating industry has, as of December 31, 2003, moved away from the use of Chromated Copper Arsenate (CCA) and increased the use of currently approved wood treating chemicals, such as Copper Azole (CA) that are higher in copper. Specifically, Exterior Wood has been made this transition well in advance of the recent deadline and, therefore, the level of copper in the stormwater runoff has consequently increased. This required wood treating chemical transition qualifies as a "material and substantial alteration(s) or addition(s) to the permitted facility (that) occurred after permit issuance which justify(ies) the application of a less stringent effluent limitation" [Clean Water Act, 33 U.S.C. at §1342(o)(2)(A)].

During Exterior Wood's treating chemical transition over the last two years (2002-03), copper has exceeded 300 µg/l twice and has averaged 155 µg/l. None of the copper results have resulted in an exceedance of the water quality criteria due to the efficiency of the diffusers on the Columbia River outfall. Exterior Wood proposes to set the interim limit for copper at 300 µg/l.

FINAL COPPER EFFLUENT LIMITATION

Based on MFA's previous experience, the implementation of BMPs for reduction of TSS may assist in reducing the copper concentrations. Exterior Wood proposes, and MFA concurs, that the implementation date for final copper effluent limits be delayed until the impact of BMPs instituted for TSS reduction have been evaluated. The evaluation would take place during the 2005-06 wet season and any additional BMPs would be identified and implemented in 2006 with the final limitations taking effect by December 31, 2006. After review of all of the factors, MFA believes this is a reasonable schedule for meeting the final copper effluent limitation of 160 µg/l.

conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Columbia River, which is designated as a Class A fresh water body. Another nearby point source outfall is the City of Washougal Publicly Owned Treatment Plant. Significant nearby non-point sources of pollutants include Gibbons Creek remnant channel with its sources of industrial and municipal storm water and the Pendleton Woolen Mills Industrial Sludge Land Application Site. Characteristic uses include the following:

Class A (Excellent) water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized in Table 6.

Table 6 Water Quality Criteria

Parameter	Criteria
Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	20 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units

Parameter	Criteria
Turbidity	less than 5 NTU above background
Arsenic (dissolved)	360 µg/L (acute criteria), 190 µg/L (chronic criteria)
Chromium (hexavalent)	15 µg/L (acute criteria), 10 µg/L (chronic criteria)
Chromium (trivalent ¹²)	376 µg/L (acute criteria), 122 µg/L (chronic criteria)
Copper ¹³	11 µg/L (acute criteria), 7.65 µg/L (chronic criteria)
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

3-year, 1-hour and 4-day stormwater runoffs have been determined by the use of Western Washington Hydrology Model 2.5b. The stormwater runoffs for acute and chronic conditions are listed in Table 7.

Table 7 3-year, 1-hour and 4-day stormwater runoffs

Stormwater runoff	cfs ¹⁴	gpm	mgd
3-year, 4-day (chronic condition)	0.57965	260	0.375
3-year, 1-hour (acute condition)	4.576	2,054	2.958
Maximum pumping rate		4,600	6.624

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of Visual Plumes. The dilution factors are listed in Table 8.

Table 8: Dilution Factors Applicable to the Discharge from Exterior Wood

	Acute	Chronic
Aquatic Life	52	216 (toxics and

¹² Hardness dependent; average hardness in the Columbia River was reported at 63.1 mg/L (Maul Foster & Alongi, Inc., 1997).

¹³ Hardness dependent

¹⁴ Feet per second

	Acute	Chronic
		metals ¹⁵ 48 (pH ¹⁶)
Human Health, Carcinogen	N/A	N/A
Human Health, Non-carcinogen	N/A	N/A

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The ambient background data used for this permit includes the following from *Ambient Water Quality Data, prepared for the Cities of Camas, Washougal, and Kalama by Cosmopolitan Engineering Group, 1996*. All other data comes from *Engineering Report; Stormwater Evaluation and Mixing Zone Study; Prepared for Allweather Wood Treaters and Exterior Wood, Inc. by Maul Foster & Alongi, Inc, 1997*.

Table 9: Ambient Conditions in the Columbia River at the Critical Condition

Parameter	Value used
7Q10 low flow	100,000 cfs
Velocity (7Q10)	1.2 ft/sec
30Q5 (November)	120,000 cfs
Velocity (30Q5)	2.4 ft/sec (not used in calculations)
Depth	17 feet
No. of diffusers	12 (4-inch diameter Red Valve™ Tideflex)
Temperature (summer)	17.6 °C
pH (high)	8.04 S.U.
Hardness	62.4 mg/L as CaCO ₃
Arsenic (total)	0.87 µg/L
Chromium (hexavalent)	0.13 µg/L (assumed total recoverable is all hexavalent)
Chromium (trivalent)	0.13 µg/L (assumed total recoverable is all trivalent)

¹⁵ Based on 1-year 4-day runoff 260 gpm

¹⁶ Based on maximum pumping rate of 4,600 gpm

Parameter	Value used
Copper (total)	1.1 µg/L

The impacts of following pollutants were determined as shown below, using the dilution factors at critical conditions described above:

1. pH
2. Arsenic
3. Chromium
4. Copper

pH--The impact of pH was modeled using the calculations from EPA, 1988. The input variables were dilution factor 48, upstream temperature 17.6° C, upstream pH 8.04, upstream alkalinity 57 (as mg CaCO₃/L), stormwater temperature 12° C, stormwater pH of 6, stormwater pH of 9, and stormwater alkalinity was assumed to be between 0 and 1000 (as mg CaCO₃/L).

Under critical conditions, there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH were placed in the permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge:

1. Arsenic
2. Chromium
3. Copper

A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit. The determination of the reasonable potential for arsenic, chromium, and copper to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during

1. 7Q10 river flows
2. 3-year, 1-hour stormwater runoff for acute surface water criteria
3. 3-year, 4-day stormwater runoff for chronic surface water criteria.

The parameters used in the critical condition modeling are as follows:

1. Acute dilution factor 52

1. Chronic dilution factor 216
3. Receiving water temperature 17.6° C
4. Receiving water alkalinity 57.31 (as mg CaCO₃/L)
5. Arsenic, chromium, and copper background concentrations listed in Table 9.

Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

The limits for arsenic and chromium are based on existing demonstrated performance during last permitting cycle. The limit for copper is based on existing demonstrated performance during the permitting cycle preceding last permitting cycle. Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize the acute toxicity of the effluent.

If acute toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with an acute toxicity limit,. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, result in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is intermittent; therefore no water quality-based effluent limitations will be developed based on the human health standard for inorganic arsenic (National Toxics Rule), in part because the criteria is based on continuous or uninterrupted discharge.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that

there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

The permit is requiring a Sediment Sampling and Analysis Plan and Sediment Data Reports.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JANUARY 30, 2001.

Table 10 Effluent limitations; outfall 001

Parameter	Units	Maximum Daily ^a	
		Existing	Proposed
pH	S.U. ¹⁷	(¹⁸)	(¹⁹)
O&G ²⁰	mg/L ²¹	10	10
TSS ²²	mg/L	270	50
Arsenic	µg/L ²³	140	111
Chromium	µg/L	210	180
Copper	µg/L	160	160
Tebuconazole	µg/L	None	20
^a The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day.			

¹⁷ Standard units

¹⁸ Within the range 6.0 to 9.0 at all times

¹⁹ Within the range 6.0 to 9.0 at all times

²⁰ Oil and grease

²¹ Milligrams per liter

²² Total suspended solids

²³ Micrograms per liter

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

OUTFALL EVALUATION

Proposed permit condition S10 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to evaluate the extent of sediment accumulations in the vicinity of the outfall.

STORMWATER MIXING STUDY

The Department has estimated the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S.12 of this permit requires the Permittee to more accurately determine the mixing characteristics of the discharge. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Maul Foster & Alongi, Inc.

1997. Engineering Report; Stormwater Evaluation and Mixing Zone Study; Prepared for Allweather Wood Treaters and Exterior Wood, Inc. Project 9009-001.002 and 9019-001.001.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 10 and August 17, 2003 in *The Columbian* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on March 23, 2004 in *The Camas-Washougal Post* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Industrial Unit Permit Coordinator
The Department of Ecology
Southwest Regional Office - Water Quality
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6280, or by writing to the address listed above.

This permit and fact sheet were drafted by Jacek Anuszewski, P.E.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

Only reasonable potential and permit limit calculation summary is provided in Appendix C. All other technical calculations are available on CD upon request.

Table 11 Reasonable potential calculation summary (1)

Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?
				Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	
	Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L	
Arsenic	1.00	1.00	1.5138	360.0000	190.0000	5.20	2.40	NO
Chromium (hex)	0.982	0.962	0.2262	15.0000	10.0000	5.83	1.55	NO
Copper	0.996	0.996	1.9140	11.0104	7.6483	10.82	4.06	NO
Chromium (tri)			0.2262	375.8591	121.9248	5.93	1.60	NO

Table 12 Reasonable potential (2)

Parameter	CALCULATIONS								
	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
		<i>P_n</i>	<i>ug/L</i>	<i>CV</i>	<i>s</i>	<i>n</i>			
Arsenic	0.95	0.867	144.00	0.60	0.55	21	1.34	52	216
Chromium (hex)	0.95	0.867	221.00	0.60	0.55	21	1.34	52	216
Copper	0.95	0.861	342.00	0.60	0.55	20	1.36	52	216
Chromium (tri)	0.95	0.867	221.00	0.60	0.55	21	1.34	52	216

Table 13 Permit limit calculation summary (1)

PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Permit Limit Calculation Summary							
			Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Technology based limits
			Acute	Chronic	<i>ug/L</i>	<i>ug/L</i>	<i>ug/L</i>	<i>ug/L</i>	<i>ug/L</i>	
Arsenic	52	216	1.00	1.00	1.51	360.00	190.00	9,293	18,643	111.00
Chromium (hex)	52	216	0.982	0.962	0.23	15.00	10.00	390	783	180.00
Copper	52	216	0.996	0.996	1.91	11.01	7.65	238	477	160.00

PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Permit Limit Calculation Summary							
			Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Technology based limits
			Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L	
Chromium (tri)	52	216			0.23	375.86	121.92	9,736	19,533	

Table 14 Permit limit calculation summary (2)

PARAMETER	Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations						Limiting LTA	Statistical variables for permit limit calculation				
	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	LTA Prob'y Basis		Coeff. Var. (CV)	AML Prob'y Basis	MDL Prob'y Basis	# of Samples per Month	
	ug/L	ug/L	ug/L	ug/L	decimal	decimal		decimal	decimal	decimal	n	
Arsenic	18643	40715	5986	21474	0.60	0.99	5986	0.60	0.95	0.99	4.00	1.00
Chromium (hex)	768	2111	247	1114	0.60	0.99	247	0.60	0.95	0.99	4.00	0.98
Copper	475	1241	152	654	0.60	0.99	152	0.60	0.95	0.99	4.00	1.00
Chromium (tri)	19533	26287	6272	13865	0.60	0.99	6272	0.60	0.95	0.99	4.00	1.00

APPENDIX D--RESPONSE TO COMMENTS

Ecology did not received any comments.